DISTRIBUTION OF 59 ORGANISMS THAT CAUSE TREE DISEASES IN ONTARIO

D. T. Myren

Information Report O-X-410

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D.T. Myren

Forestry Canada
Ontario Region
Great Lakes Forestry Centre

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ABSTRACT

Maps depicting collection points of 59 fungi associated with tree diseases in Ontario are presented. The locations of collection points were determined from the records of the Forest Insect and Disease Survey Unit of Forestry Canada, Ontario Region for the period from 1957 to 1988. Brief notes accompany each map and include such information as the taxonomic position of the fungus, the hosts on record and the collections retained in Ontario Region's herbarium.

RÉSUMÉ

Le présent rapport contient des cartes montrant les sites de prélèvement de 59 champignons associés à des maladies des arbres en Ontario. L'emplacement de ces sites a été déterminé à partir des dossiers de l'unité du Relevé des insectes et des maladies des arbres de Forêts Canada, Région de l'Ontario, pour la période de 1957 à 1988. Chaque carte est accompagnée de brèves notes qui fournissent des renseignements divers, notamment le classement taxonomique du champignon, les hôtes connus et les collections conservées à l'herbarium de la Région de l'Ontario.

ACKNOWLEDGMENTS

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Cover photo: *Taphrina caerulescens* leaf blister on red oak.

INTRODUCTION

In 1977, an information report was published to provide a record of the distribution (in map form), hosts, number of records, taxonomy and herbarium specimens for 58 of the more common organisms that cause tree diseases in Ontario (Myren and Gross 1977). Since that time, several diseases not included in the earlier report have increased significantly in their importance and some diseases new to Ontario have been collected. This report provides information on these diseases and a number of others collected by Forestry Canada's Forest Insect and Disease Survey (FIDS) staff from 1967 to 1988.

Collection records accumulated during this time are the foundation on which the present publication is based. Most of these records are compiled from data submitted with disease samples by field staff and from the identification made by the FIDS unit's Mycologist or Disease Identification Technician. Herbarium collections from sources outside FIDS are also covered. In total, 59 organisms and 1,701 records have been included in this study.

Occurrence and distribution of the organisms selected for coverage in this report are indicated by dots on a series of maps; each dot indicates the general area in which one or more collections of an organism were made; hence, the number of dots does not necessarily coincide with the number of collections, and is usually smaller. It must be recognized that the points on the maps indicate locations at which collections have been made and do not necessarily represent the actual distribution of an organism. The distribution of host-specific organisms in Ontario usually coincides with the range of the host. Range maps of native trees can be found in *Native Trees of Canada* (Hosie 1979). Some information on other hosts can be found in *Gray's Manual of Botany* (Fernald 1970).

The causal organisms are arranged alphabetically by genus and species, without regard to taxonomic position. A brief set of notes provides the Latin binomial, classifying authors and taxonomic position for each organism. Also presented are the diseases caused, the recorded hosts, the number of records on which distribution is based, and the number of samples in the Forestry Canada, Ontario Region herbarium. Synonyms are included where they are felt to be of value and the anamorph is indicated, if known. Indices of common names and Latin binomials of pathogenic organisms and of host plants are also provided.

Taxonomy for the Ascomycetes follows that of Ainsworth et al. (1973). Taxonomy for the Basidiomycetes and Deuteromycetes follows that of Hawksworth et al. (1983). The recommendations of Hawksworth (1980) were followed for the names of authors and current Latin binomials for the fungi are as given by Ginns (1986). Hosie (1979) served as the main reference for Latin binomials and common names of tree hosts, but either Fernald (1950) or Little (1953) was used if Hosie's text did not include the name of a species.

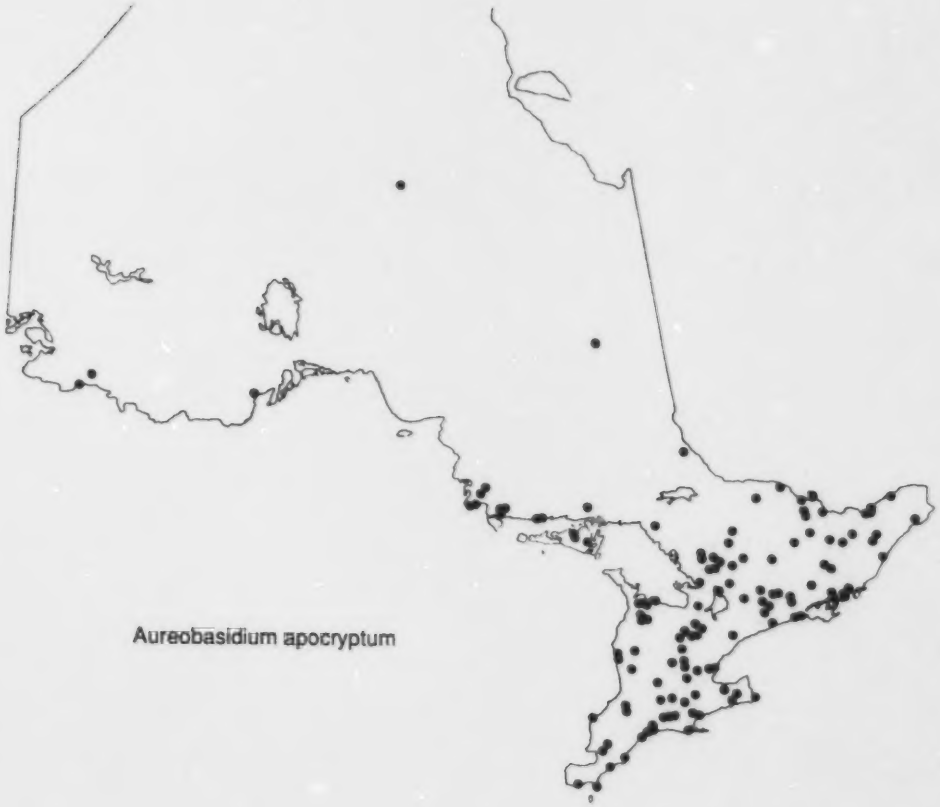
DISEASES AND COLLECTION POINTS

Aureobasidium apocryptum (Ell. & Ev.) Hermanides-Nijhof
syn.: *Kabatiella apocrypta* (Ell. & Ev.) v. Arx
syn.: *Gloeosporium apocryptum* Ell. & Ev.

Taxonomic position:	Deuteromycotina, Hyphomycetes, Hyphomycetales, Moniliaceae
Disease caused:	anthracnose
Hosts on record:	*Acer nigrum*, *A. platanoides*, *A. rubrum*, *A. saccharinum*, *A. saccharum*, *Acer* sp.
Number of records:	193
Herbarium specimens:	*Acer rubrum* (1) *Acer saccharum* (3)
Remarks:	A common cause of anthracnose of maple in Ontario. *Acer saccharum* is its most common host.

Climacodon septentrionalis (Fr.) P. Karsten
syn.: *Hydnum septentrionale* Fr.
syn.: *Steccherinum septentrionale* (Fr.) Banker

Taxonomic position:	Basidiomycotina, Hymenomycetes, Aphyllophorales, Hydnaceae
Disease caused:	heartwood rot
Hosts on record:	*Acer saccharum*, *Fagus* sp.
Number of records:	11
Herbarium specimens:	*Acer saccharum* (4) *Fagus* sp. (1)
Remarks:	A soft, spongy white rot of the heartwood of living *Acer* spp. and other hardwoods. Fruiting bodies are formed on the trunk as large, bracketlike clusters.



Aureobasidium apocryptum

Climacodon septentrionalis

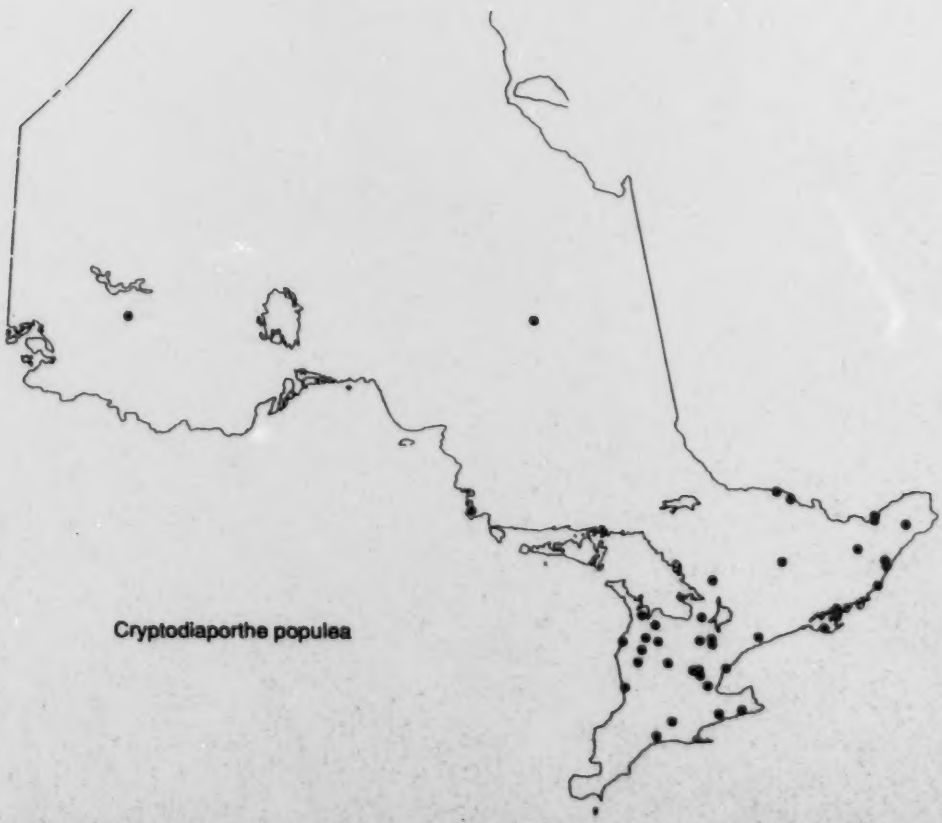
Coleosporium viburni Arthur

Taxonomic position:	Basidiomycotina, Urediniomycetes, Uredinales, Melampsoraceae
Disease caused:	needle rust
Hosts on record:	*Pinus banksiana*, *Viburnum cassinoides*
Number of records:	4
Herbarium specimens:	*Pinus banksiana* (1) *Viburnum cassinoides* (1)
Remarks:	This rust seems to be infrequent in Ontario, but this may reflect the fact that most field identifications are made as *Coleosporium asterum*. Spore measurements easily separate the two species.

Cryptodiaporthe populea (Sacc.) Butin
ana.: *Discosporium populeum*
syn.: *Dothichiza populea* Sacc. & Briard

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	poplar canker
Hosts on record:	*Populus alba*, *P. balsamifera*, *P. eugenii*, *P. nigra* var. *italica*, *Populus* sp.
Number of records:	45
Herbarium species:	*Populus alba* (1) *P. alba* var. *nivea* (1) *P. balsamifera* (2) *P. grandidentata* (2) *P. nigra* var. *italica* (17) *Populus* sp. (1)
Remarks:	This fungus is native to North America and is a serious cause of cankers on exotic poplars. It is particularly serious on *Populus nigra* var. *italica*.

Coleosporium viburni



Cryptodiaporthe populea

Diplocarpon mespili (Sorauer) B. Sutton
ana.: *Entomosporium maculatum* Lév.
ana.: *Entomosporium mespili* (DC.) Sacc.
syn.: *Fabraea maculata* Atk.

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Dermateaceae
Disease caused:	pear leaf blight
Hosts on record:	*Crataegus monogyna*, *C. oxycantha*, *Crataegus* sp., *Sorbus americana*, *S. decora*, *Sorbus* sp.
Number of records:	13
Herbarium specimens:	*Crataegus oxycantha* (1) *Crataegus* sp. (3) *Sorbus decora* (1) *Sorbus* sp. (1)
Remarks:	This fungus causes a leaf blight of *Pyrus* spp. and a number of other rosaceous species. The fungus affects both the leaves and fruit and can cause twig cankers.

Discula betulina (Westend.) v. Arx
syn.: *Gloeosporium betulinum* Westend.

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	anthracnose
Hosts on record:	*Betula papyrifera*
Number of records:	5
Herbarium specimens:	nil
Remarks:	*Discula betulina* causes leaf spots and premature defoliation of *Betula* spp. It is not considered common in Ontario.

Diplocarpon mespili

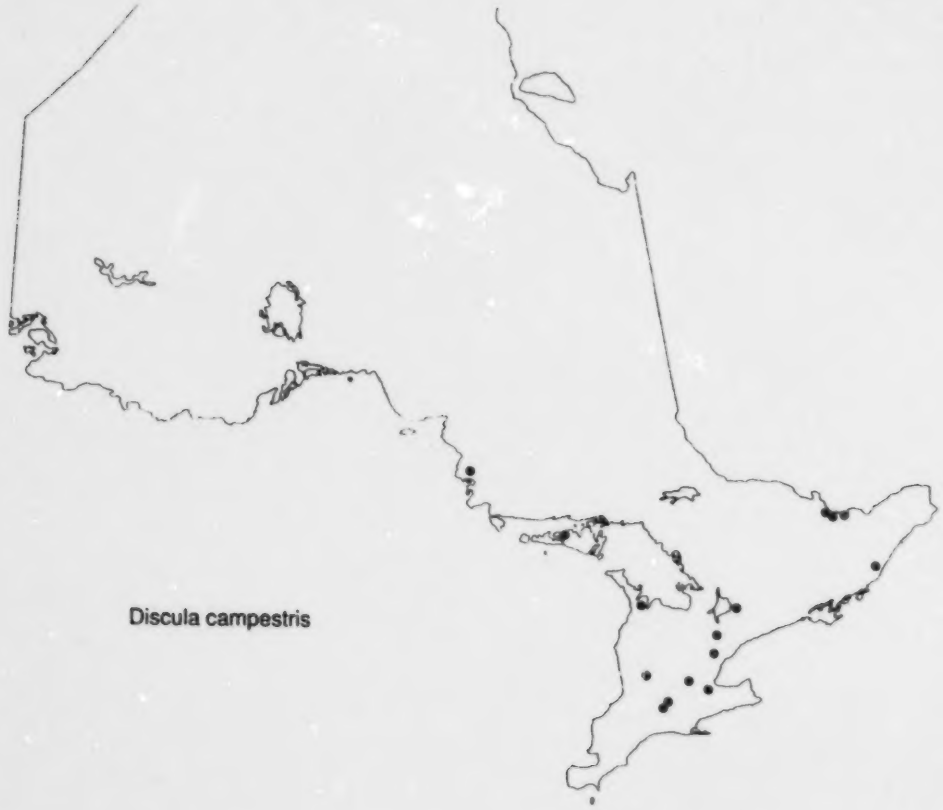
Discula betulina

Discula campestris (Pass.) v. Arx

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	anthracnose
Hosts on record:	*Acer nigrum*, *A. saccharinum*, *A. saccharum*
Number of records:	17
Herbarium specimens:	*Acer nigrum* (1) *A. saccharinum* (1) *A. saccharum* (4)
Remarks:	This anthracnose fungus is not uncommon in portions of southern Ontario but, without laboratory examination, may be mistaken for other anthracnose fungi.

Discula platani (Peck) Sacc.
syn.: *Gloeosporium nervisequum* (Fuckel) Sacc.
syn.: *Gloeosporium platani* (Mont.) Oudem.

Taxonomic position:	Deuteromycotina, Coelomycetidae, Melanconiales, Melanconiaceae
Disease caused:	anthracnose
Hosts on record:	*Platanus* sp.
Number of records:	3
Herbarium specimens:	*Platanus* sp.
Remarks:	*Platanus* is is not a common tree in Ontario, which is probably why the collection number is so low. Some collections of this fungus may be listed under *D. umbrinella* (Berk. & Broome) Morelet.



Discula campestris

Discula platani

Drepanopeziza populi-alba (Kleb.) Nannf.
ana.: *Marssonina castagnei* (Desm. & Mont.) Magnus

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Dermateaceae
Disease caused:	Marssonina leaf spot
Hosts on record:	*Populus alba*
Number of records:	4
Herbarium specimens:	*Populus alba* (1)
Remarks:	This fungus has been collected only in the *Marssonina* states and is limited to *Populus alba*.

Drepanopeziza populorum (Desm.) Höhnel
ana.: *Marssonina populi* (Lib.) Magnus
ana.: *Marssonina populi-nigrae* Kleb.

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Dermateaceae
Disease caused:	Marssonina leaf spot
Hosts on record:	*Populus alba*, *P. balsamifera*, *P. canadensis*, *P. eugenii*, *P. grandidentata*, *P. tremuloides*, *Populus* sp., hybrid poplar
Number of records:	31
Herbarium specimens:	*Populus eugenii* (2) *Populus tremuloides* (1) hybrid poplar (1)
Remarks:	The fungus is found only in the *Marssonina* states. *Drepanopeziza populorum*, the teleomorph, has not been recorded in North America but is found on overwintered leaves in Europe.

Drepanopeziza populi-alba

Drepanopeziza populorum

Drepanopeziza salicis (Tul. & C. Tul.) Höhnel
ana.: *Gloeosporium salicis* Westend.
ana.: *Monostichella salicis* (Westend.) v. Arx

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Dermateaceae
Diseases caused:	leaf spot
Hosts on record:	*Salix* sp.
Number of records:	2
Herbarium specimens:	*Salix* sp. (2)
Remarks:	A rarely collected black leaf spot on *Salix* spp. Collected only as *Monostichella salicis*, although the teleomorph is apparently known in North America.

Drepanopeziza tremulae Rimpau
ana.: *Gloeosporium brunneum* Ell. & Ev.
ana.: *Marssonina brunnea* (Ell. & Ev.) Magnus

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Dermateaceae
Disease caused:	leaf spot
Hosts on record:	*Populus eugenei*, *P. grandidentata*, *Populus* sp., *P. tremuloides*, hybrid poplar
Number of records:	35
Herbarium specimens:	*Populus* sp. (2) *Populus tremuloides* (2) hybrid poplar (2)
Remarks:	Apparently only the anamorph, *M. brunnea*, is found in North America; the holomorph has been reported from Europe.

Drepanopeziza salicis

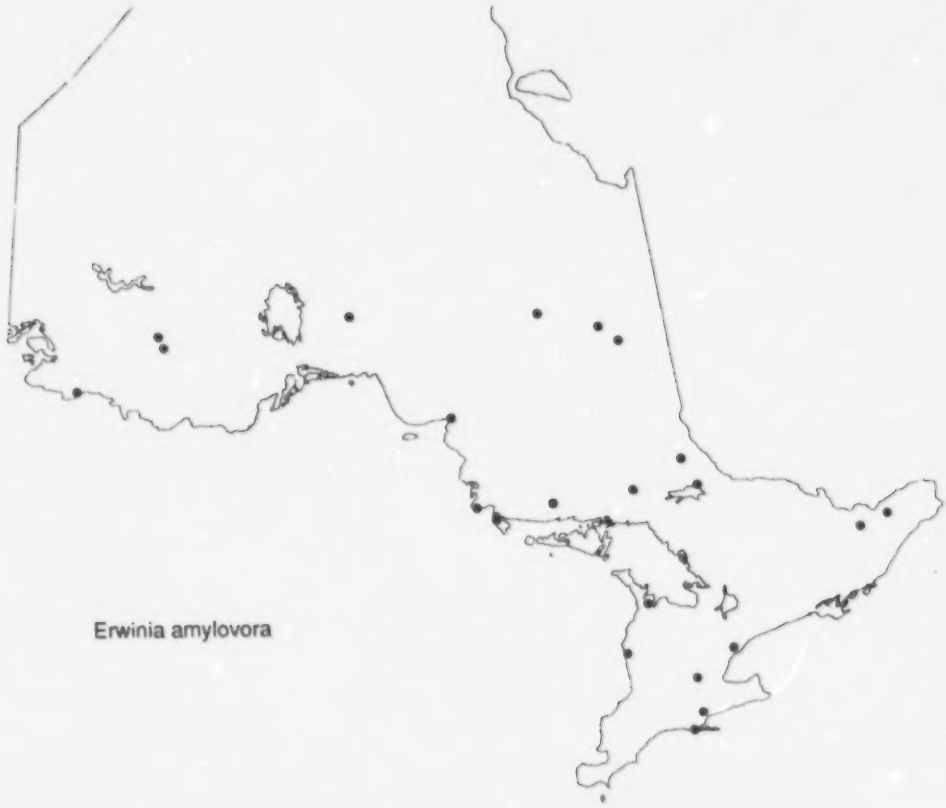
Drepanopeziza tremulae

Erwinia amylovora (Burrill) Winslow et al.

Taxonomic position:	Bacteria, Eubacteriales, Enterobacteriaceae, Erwinieae
Disease caused:	fire blight
Hosts on record:	*Malus* sp., *Sorbus americana*, *S. aria utescens*, *S. aucuparia*, *S. decora*, *Sorbus* sp.
Number of records:	33
Herbarium specimens:	*Sorbus aria utescens* (1)
Remarks:	Fire blight is the most serious disease of members of the genus *Sorbus*, and results in the death of many of these trees, which are used as ornamentals.

Gnomonia leptostyla (Fr.) Ces. & de Not.
ana.: *Marssoniella juglandis* (Lib.) Höhnel
ana.: *Marssonina juglandis* (Lib.) Magnus

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	leaf spot
Hosts on record:	*Juglans cinerea*, *J. nigra*, *Juglans* sp.
Herbarium specimens:	*Juglans cinerea* (4) *J. nigra* (2) *Juglans* sp. (4)
Remarks:	This fungus can infect and kill young shoots as well as leaves. It is the most serious foliar disease of *Juglans nigra* in Ontario and can cause extensive premature defoliation.



Erwinia amylovora

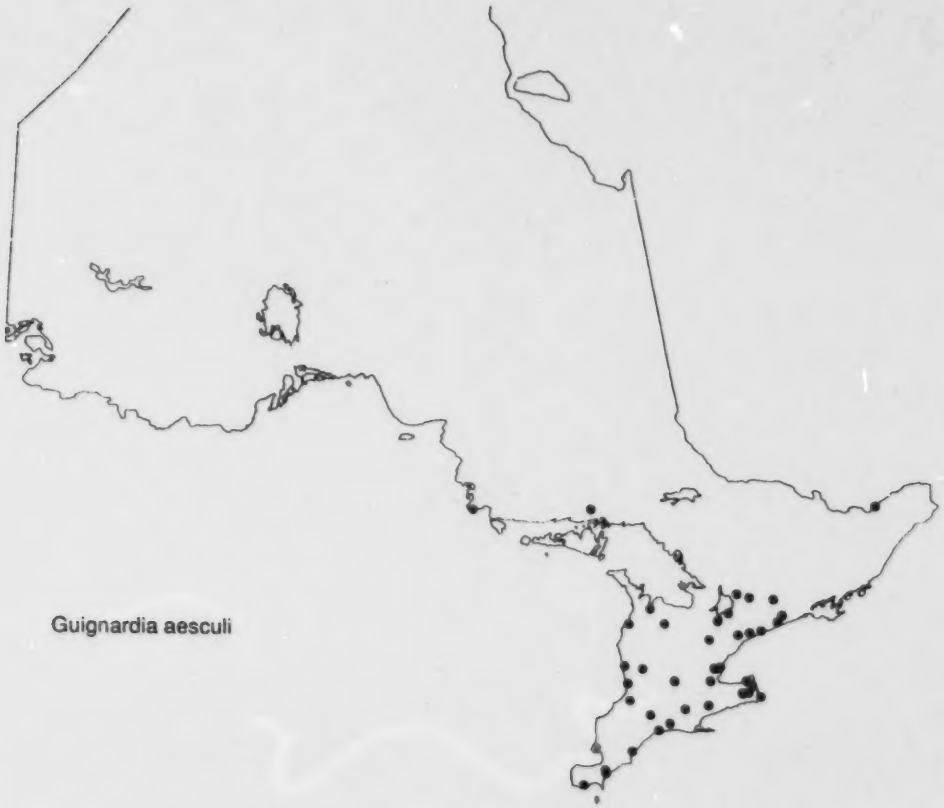
Gnomonia leptostyla

Guignardia aesculi (Peck) Stewart
ana.: *Leptodothiorella aesculicola* (Sacc.) Sivan.
ana.: *Phyllosticta paviae* Desm.
ana.: *Phyllosticta sphaeropsoidea* Ell. & Ev.

Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	leaf blotch
Hosts on record:	*Aesculus hippocastanum*
Number of records:	47
Herbarium specimens:	*Aesculus hippocastanum* (10)
Remarks:	The presence of the *Phyllosticta* state of the fungus readily distinguishes this disease from a somewhat similar problem caused by heat and drought. Severe infections can involve the entire tree and cause premature defoliation.

Leucostoma kunzei (Fr.) Munk
ana.: *Cytospora kunzei* Sacc.

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	Cytospora canker
Hosts on record:	*Abies balsamea*, *Larix decidua*, *Picea abies*, *P. glauca*, *P. mariana*, *P. pungens*, *P. rubens*, *Pinus strobus*
Number of records:	81
Herbarium specimens:	*Larix decidua* (1) *Picea abies* (1) *P. glauca* (4) *P. pungens* (3) *Picea* sp. (1) *Pinus strobus* (6)
Remarks:	This fungus is most damaging to ornamental *Picea* spp., particularly *P. pungens*, on which its characteristic killing of individual branches destroys the value of its host. The presence of pitch on infected branches is characteristic of the disease.



Guignardia aesculi

Leucostoma kunzei

Leucostoma nivea (Hoffm.: Fr.) Höhnel
ana.: *Cytospora nivea* (Hoffm.) Fr.

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	Cytospora canker
Hosts on record:	*Populus grandidentata*, *P. nigra*, *P. nigra* var. *italica*, *Populus* sp., *P. tremuloides*
Herbarium specimens:	*Populus grandidenta* (1) *P. nigra* (1) *P. tremuloides* (4) *Populus* sp. (1)
Remarks:	The white disk and reddish tendrils are characteristic of the *Cytospora* state of this fungus.

Linospora tetraspora G.E. Thompson

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	leaf blight
Hosts on record:	*Populus balsamifera*
Number of records:	69
Herbarium specimens:	*Populus balsamifera* (6)
Remarks:	This leaf blight is very common in Ontario and is limited to *Populus balsamifera*. A number of small black dots (pseudoclypei) on the upper leaf surface is a useful diagnostic feature of the disease.

Leucostoma nivea

Linospora tetraspora

Marssonina betulae (Lib.) Magnus

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	leaf spot
Hosts on record:	*Betula glandulosa*
Number of records:	2
Herbarium specimens:	*Betula glandulosa* (2)
Remarks:	This leaf spots is also known on *Betula papyrifera*, but is uncommon on that host. The small number of collections may reflect the true occurrence of this leaf spot, as *Betula* spp. are frequently sampled.

Marssonina martini (Sacc. & Ell.) Magnus

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	leaf spot
Hosts on record:	*Quercus alba*, *Q. macrocarpa*, *Q. prinus*
Number of records:	4
Herbarium specimens:	*Quercus alba* (1) *Q. macrocarpa* (1) *Q. prinus* (1)
Remarks:	The fact that fungus has never caused a serious problem on *Quercus* spp. in Ontario probably accounts for the small number of collections. The fungus is thought to be fairly common throughout the range of its host in the province.

Marssonina betulae

Marssonina martini

Marssonina quercina (Winter) Lentz

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	leaf spot
Number of records:	2
Herbarium specimens:	*Quercus rubra* (2)
Hosts on record:	*Quercus rubra*
Remarks:	An infrequently encountered leaf spot of *Quercus* spp.

Meria laricis Vuill.

Taxonomic position:	Deuteromycotina, Hyphomycetes, Hyphomycetales, Moniliaceae
Disease caused:	needle cast
Hosts on record:	*Larix decidua*, *Larix* sp.
Number of records:	14
Herbarium specimens:	*Larix decidua* (2) *Larix* sp. (2)
Remarks:	Collections are from plantations of *Larix decidua* and represent the first North American collections on this host, and the first collections of the fungus in eastern North America. The fungus has also been found on stock from the Ontario Ministry of Natural Resources nursery at Orono.

Marssonina quercina

Meria laricis

Mycosphaerella dearnessii Barr
ana.: *Lecanosticta acicola* (Thüm) Sydow
syn.: *Scirrhia acicola* (Dearn.) Siggers

Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	brown-spot needle blight
Hosts on record:	*Pinus mugo* var. mughus, *P. nigra*
Number of records:	9
Herbarium specimens:	*Pinus mugo* var. *mughus* (3) *P. nigra* (2)
Remarks:	Since the first detection of this disease in 1980, most collections have been made on *Pinus mugo* var. *mughus*, probably because this host is used as an ornamental and is observed closely. This fungus can cause damage to young *Pinus* spp. plantations but no collections have yet been made from plantations in Ontario.

Mycosphaerella effigurata (Schwein.) House
ana.: *Asteromella fraxini* (Berk. & M.A. Curtis) Petrak
ana.: *Cylindrosporium fraxini* (Ell. & Kellerman) Ell. & Ev.

Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	leaf spot
Hosts on record:	*Fraxinus nigra*, *F. pennsylvanica*, *Fraxinus* sp.
Number of records:	10
Herbarium specimens:	nil
Remarks:	The small number of collections of this fungus, considered the cause of one of the more common leaf spots of *Fraxinus* spp., probably reflects a lack of emphasis on foliar problems of this host.

Mycosphaerella dearnessii

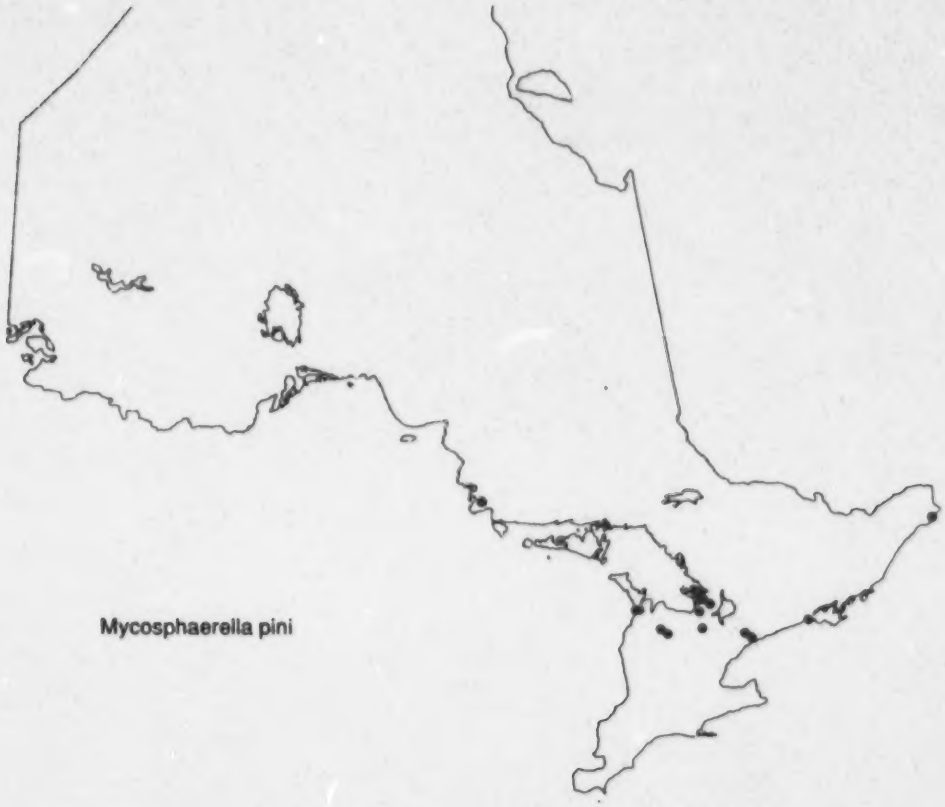
Mycosphaerella effigurata

Mycosphaerella pini Rostrup
ana.: *Dothistroma septospora* (Dorogin) Morelet var. *septospora*
syn.: *Scirrhia pini* Funk & Parker

Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	red-band disease
Hosts on record:	*Pinus contorta*, *P. nigra*
Number of records:	20
Herbarium specimens:	*Pinus nigra* (4)
Remarks:	This fungus is found primarily on *Pinus nigra* in southern Ontario. A recent collection on *Pinus sylvestris* was made near Sault Ste. Marie.

Mycosphaerella populi (Auersw.) Schröter
ana.: *Septoria populi* Desm.

Taxonomic position:	Ascomycotina, Loculaoscomycetes, Dothideales, Dothideaceae
Disease caused:	leaf spot
Hosts on record:	*Populus balsamifera*
Number of records:	1
Herbarium specimens:	*Populus balsamifera* (1)
Remarks:	An infrequently found leaf spot, but this may reflect the fact that *Populus balsamifera* is not a commonly sampled host.



Mycosphaerella pini

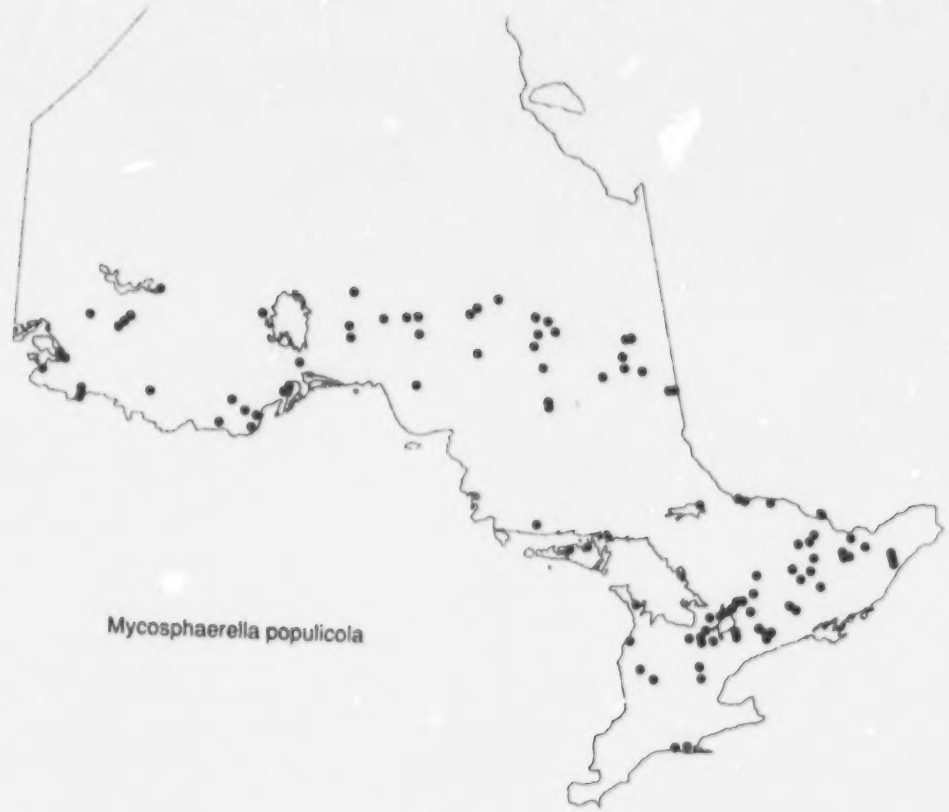
Mycosphaerella populi

Mycosphaerella populicola G.E. Thompson
ana.: *Septoria populicola* Peck

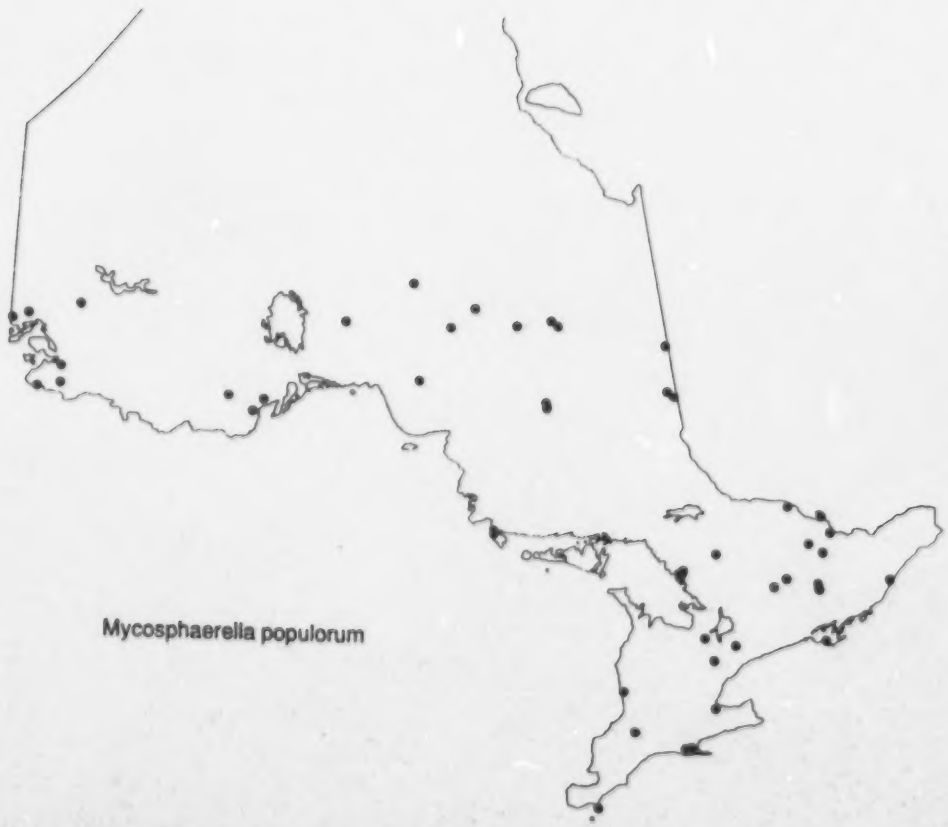
Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	leaf spot
Hosts on record:	*Populus alba*, *P. balsamifera*, *P. deltoides*, *Populus* sp., *P. tremuloides*
Number of records:	113
Herbarium specimens:	*Populus balsamifera* (7) *Populus* sp. (1)
Remarks:	Collections indicate that this fungus is somewhat more common than *M. populorum* G.E. Thompson and is the cause of severe premature defoliation of *Populus balsamifera* each year.

Mycosphaerella populorum G.E. Thompson
ana.: *Septoria musiva* Peck

Taxonomic position:	Ascomycotina, Loculoascomycetes, Dothideales, Dothideaceae
Disease caused:	leaf spot
Hosts on record:	*Populus balsamifera*, *P. berolinensis*, *P. deltoides*, *P. deltoides var. occidentalis* *P. laurifolia*, *P. petrowskyana*, *P. rasumowskyana*, *P. trichocarpa*, hybrid poplar
Number of records:	76
Herbarium specimens:	*Populus balsamifera* (16) *P. berolinensis* (3) *P. deltoides* (3) *P. deltoides* var. *occidentalis* (1) *P. laurifolia* (1) *P. petrowskyana* (2) *P. rasumowskyana* (13) *P. trichocarpa* (1) *Populus* sp. (1)
Remarks:	A common leaf spot on *Populus balsamifera* and hybrid *Populus*, this fungus often causes premature defoliation of its hosts.



Mycosphaerella populicola



Mycosphaerella populorum

Phaeocryptopus gaeumannii (Rohde) Petrak
syn.: *Adelopus gaeumannii* Rohde

Taxonomic position:	Ascomycotina, Loculoascomoycetes Pleosporales, Venturiaceae
Disease caused:	Swiss needle cast
Hosts on record:	*Pseudotsuga menziesii*
Number of records:	6
Herbarium specimens:	*Pseudotsuga menziesii* (4)
Remarks:	This disease is becoming more common with the increasing number of plantations of *Pseudotsuga menziesii* established for Christmas tree production.

Phaeoramularia maculicola (Romell & Sacc.) B. Sutton
syn.: *Cladosporium subsessile* Ell. & Barth.

Taxonomic position:	Deuteromycotina, Hyphomycetes, Hyphomycetales, Dematiaceae
Disease caused:	leaf spot
Hosts on record:	*Populus eugenei*, *P. grandidentata*, *Populus* sp., *P. tremuloides*
Number of records:	19
Herbarium specimens:	*Populus grandidentata* (3) *P. tremuloides* (2) *Populus* sp. (1)
Remarks:	The small size of the lesions, 0.5 mm in diameter, does not make this disease striking unless infection is quite heavy. The disease does appear similar to secondary infection by shoot blight of poplar (*Venturia macularis* (Fr.) Müller & v. Arx).

Phaeocryptopus gaeumannii

Phaeoramularia maculicola

Phellinus everhartii (Ell. & Gall.) A. Ames
syn.: *Fomes everhartii* (Ell. & Gall.) von Schrenk and Spaulding

Taxonomic position:	Basidiomycotina, Hymenomycetes, Aphyllophorales, Hymenochaetaceae
Disease caused:	trunk rot
Hosts on record:	*Quercus rubra*, *Quercus* sp.
Number of records:	5
Herbarium specimens:	*Quercus rubra* (2) *Quercus* sp. (1)
Remarks:	Although *Quercus* spp. are the most common hosts, and the only hosts of record in Ontario, the fungus is known to cause decay in other hardwoods.

Phyllosticta minima (Berk. & M.A. Curtis) Underw. & Earle

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Sphaerioidaceae
Disease caused:	leaf spot
Hosts on record:	*Acer ginnala*, *A. pseudoplatanus*, *A. rubrum*, *A. saccharum*, *A. spicatum*
Number of records:	32
Herbarium specimens:	*Acer ginnala* (1) *A. pseudoplatanus* (1) *A. rubrum* (3) *A. saccharum* (1) *A. spicatum* (1)
Remarks:	A common leaf spot on *Acer* spp. that is often confused with a somewhat similar midge spot. The latter has a concave area in the center of the spot when viewed from below.

Phellinus everhartii

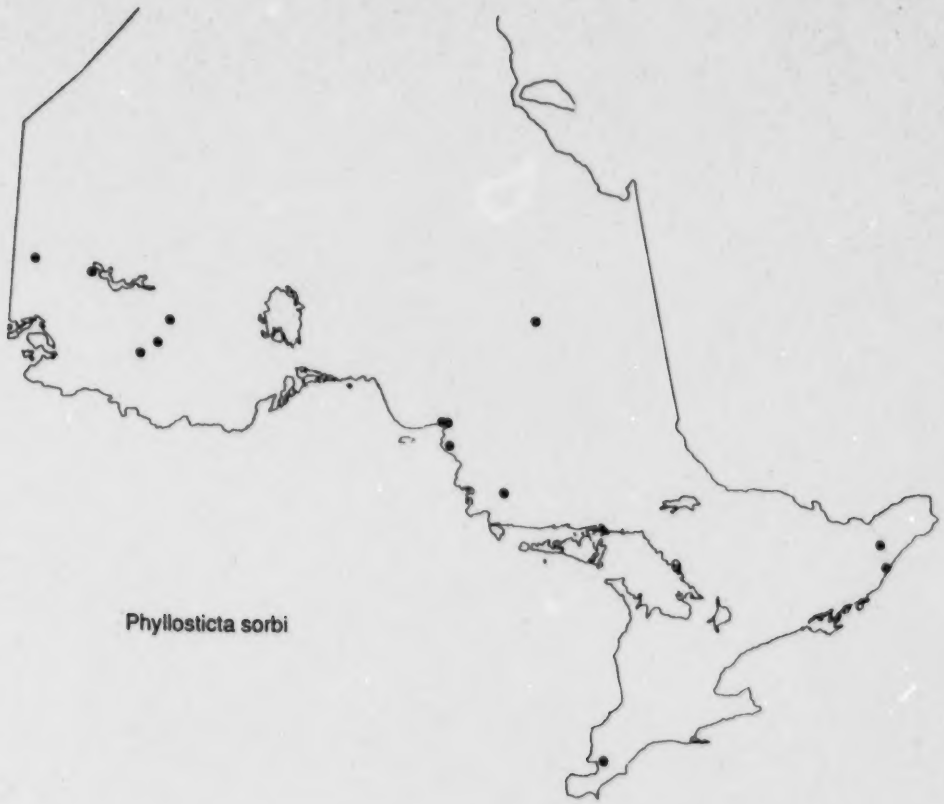
Phyllosticta minima

Phyllosticta sorbi Westend.

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Sphaerioidaceae
Disease caused:	leaf spot
Hosts on record:	*Sorbus americana*
Number of records:	14
Herbarium specimens:	*Sorbus americana* (2)
Remarks:	*Sorbus americana* is native to much of Ontario but most collections have been from ornamental trees. The fungus, which produces a brown spot on the leaflets, is the anamorph of *Mycosphaerella aucupariae* (Lasch) Laibach.

Piggotia coryli (Desm.) B. Sutton
syn.: *Monostichella coryli* (Desm.) Höhnel

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Leptostromataceae
Disease caused:	leaf spot
Hosts on record:	*Corylus cornuta*
Number of records:	2
Herbarium specimens:	*Corylus cornuta* (2)
Remarks:	*Corylus cornuta* is not regularly sampled, but the fungus appears to be uncommon nonetheless.



Phyllosticta sorbi

Piggotia coryli

Pleuroceras populi G.E. Thompson
ana.: *Marssonina rhabdospora* (Ell. & Ev.) Magnus

Taxonomic position:	Ascomycotina, Pyrenomycetes, Diaporthales, Valasaceae
Disease caused:	leaf spot
Hosts on record:	*Populus grandidentata*, *P. tremuloides*
Number of records:	7
Herbarium specimens:	*Populus grandidentata* (5) *P. tremuloides* (1)
Remarks:	Collected only in the *Marssonina* states. Although not frequently collected, the fungus does not appear to be uncommon.

Puccinia sparganioides Ell. & Barth.

Taxonomic position:	Basidiomycotina, Urediniomycetes, Uredinales, Pucciniaceae
Disease caused:	leaf rust
Hosts on record:	*Fraxinus pennsylvanica*
Number of records:	1
Herbarium specimens:	nil
Remarks:	The alternate host for this rust is *Spartina* spp. grass, but no collections on this host have been made by FIDS in Ontario. It has been reported on *Spartina pectinata* and *Spartina* sp. by other collectors.

Pleuroceras populi

Puccinia sparganioides

Rhabdocline pseudotsugae Sydow ssp. *pseudotsugae*

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Hemiphacidiaceae, Rhytismatales, Rhytismataceae
Disease caused:	needle cast
Hosts on record:	*Pseudotsuga menziesii*, *Pseudotsuga* sp.
Number of records:	3
Herbarium specimens:	*Pseudotsuga* sp. (3)
Remarks:	Although the host is scattered as an ornamental in the southern part of the province, the disease has been found only where *Pseudotsuga* spp. have been used in Christmas tree plantations.

Rhizina undulata Fr.
syn.: *Rhizina inflata* (Schäffer) Quélet

Taxonomic position:	Ascomycotina, Discomycetes, Pezizales, Pezizaceae
Disease caused:	root rot
Hosts on record:	*Picea mariana*, *Pinus banksiana*, *P. resinosa*, *P. strobus*
Number of record:	37
Herbarium specimens:	ground (1) humicolous (3) *Pinus banksiana* (1) *P. resinosa* (2)
Remarks:	This fungus, which is usually found fruiting on burned areas in the year following the fire, has been associated with root rot of *Pinus strobus* and *Quercus rubra* seedlings. It is suspected as the cause of mortality of young *Pinus* spp. and *Picea* spp. planted on recently burned sites.

Rhabdocline pseudotsugae

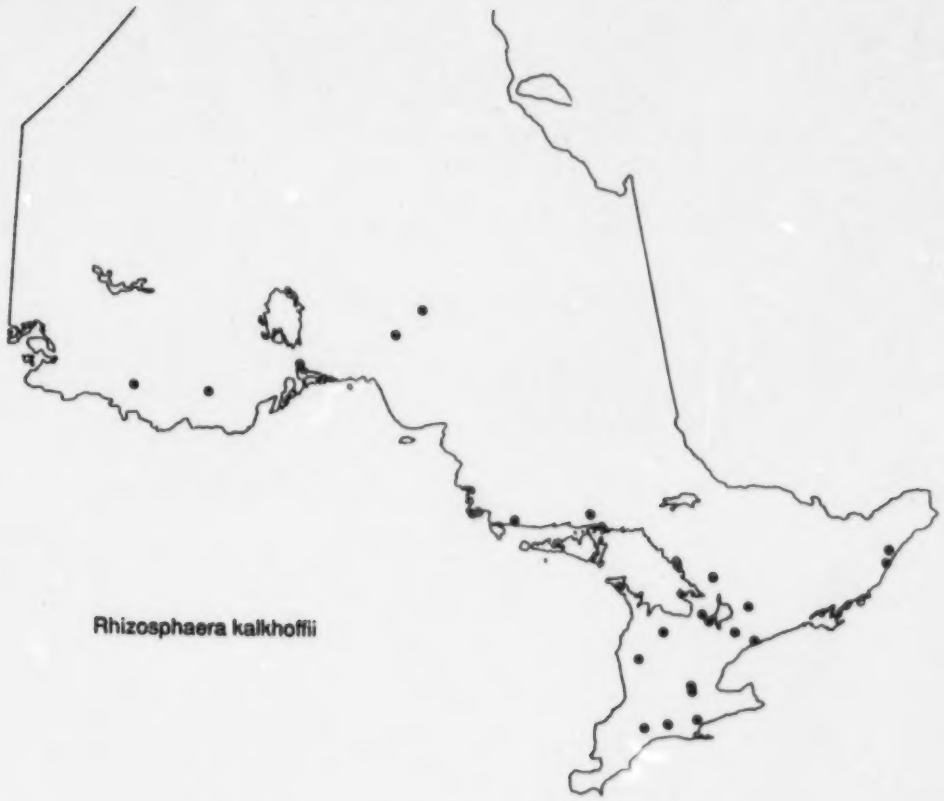
Rhizina undulata

Rhizosphaera kalkhoffii Bubák

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Sphaeropsidaceae
Disease caused:	needle blight
Hosts on record:	*Picea glauca*, *P. mariana*, *P. pungens*, *Picea* sp.
Number of records:	36
Herbarium specimens:	*Picea glauca* (2) *P. pungens* (3)
Remarks:	This fungus is a fairly common cause of minor needle blight and is often found on senescent *Picea* spp. needles. *Rhizosphaera pini* (Corda) Maubl. is similar and causes needle blight on *Picea* spp. and *Abies* spp. The two fungi are easily distinguished by spore size.

Rhizosphaera pini (Corda) Maubl.
syn.: *Coniothyrium pini* Corda

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Sphaeropsidaceae
Disease caused:	needle blight
Hosts on record:	*Abies balsamea*
Number of records:	31
Herbarium specimens:	*Abies balsamea* (4)
Remarks:	*Rhizosphaera kalkhoffii* Bubák is also found on *Abies balsamea*, but can be differentiated by the size of its spores.



Rhizosphaera kalkhoffii

Rhizosphaera pini

Sarcotrochila balsamea (J. Davis) Korf
syn.: *Phacidium balsamea* J. Davis

Taxonomic position:	Ascomycotina, Discomycetes, Helotiales, Hemiphacidiaceae
Disease caused:	snow blight
Hosts on record:	*Abies balsamea*
Number of records:	18
Herbarium specimens:	*Abies balsamea* (8)
Remarks:	A rather common snow blight in northern *Abies balsamea* areas; this species of fir is not a nursery crop in Ontario, which tends to reduce the impact of the fungus.

Sphaeropsis sapinea (Fr.) Dyko & B. Sutton
syn.: *Diplodia pinea* (Desm.) Kickx

Taxonomic position:	Deuteromycotina, Coelomycetes, Sphaeropsidales, Sphaeropsidaceae
Disease caused:	Diplodia tip blight
Hosts on record:	*Larix decidua*, *L. laricina*, *Picea abies*, *P. pungens*, *Pinus banksiana*, *P. monticola*, *P. nigra*, *P. ponderosa*, *P. resinosa*, *P. strobus*, *P. sylvestris*, *Pseudotsuga menziesii*
Number of records:	145
Herbarium specimens:	*Pinus banksiana* (1) *P. nigra* (1) *P. resinosa* (2) *P. sylvestris* (4) *Pseudotsuga menziesii* (1) cone (1)
Remarks:	This fungus seems to have increased in severity over the last several years. It was found to be killing *Pinus resinosa* in one of the provincial forestry nurseries in 1987, and the infection originated from heavily infected windbreaks. The disease has also been responsible for mortality on large *Pinus sylvestris*.

Sarcotrochila balsamea

Sphaeropsis sapinea

Stegonsporium sp.

Taxonomic position:	Deuteromycotina, Coelomycetes, Melanconiales, Melanconiaceae
Disease caused:	branch and twig canker
Hosts on record:	*Acer platanoides*, *A. rubrum*, *A. saccharinum*, *A. saccharum*
Number of records:	123
Herbarium specimens:	*Acer platanoides* (1) *A. saccharinum* (12) *A. saccharum* (2)
Remarks:	There are only two species of *Stegonsporium*, *S. acerinum* Peck and *S. pyriforme* (Hoffm.:Fr.) Corda. Changes in nomenclature have made the species determination in many early collections questionable, so no species designation is given here. J. Bisset (1977) states that *S. acerinum* is restricted to *Acer saccharum*.

Taphrina americana Mix

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	witches' broom
Hosts on record:	*Betula papyrifera*
Number of records:	1
Herbarium specimens:	*Betula papyrifera* (1)
Remarks:	This fungus also causes witches' broom on *Betula alleghaniensis*, on which it has been recorded in New England. The fungus is considered to occur only occasionally.

Stegonsporium sp.

Taphrina americana

Taphrina caerulescens (Desm. & Mont.) Tul.

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	leaf blister
Hosts on record:	*Quercus alba*, *Q. macrocarpa*, *Q. rubra*, *Quercus* sp.
Number of records:	32
Herbarium specimens:	*Quercus alba* (1) *Q. macrocarpa* (1) *Q. rubra* (8)
Remarks:	Relatively common in Ontario, with most of our records coming from ornamental *Quercus* spp.

Taphrina carnea Johanson

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	red leaf blister
Hosts on record:	*Betula alba*, *B. papyrifera*
Numbers of record:	2
Herbarium specimens:	*Betula alba* (1) *B. papyrifera* (1)
Remarks:	This thickened, reddish-yellow leaf deformation also occurs on *Betula alleghaniensis*.

Taphrina caerulescens

Taphrina carnea

Taphrina communis (Sadebeck) Giesenh.

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	plum pocket
Hosts on record:	*Prunus americana* var. *nigra*, *P. nigra*, *Prunus* sp.
Number of records:	10
Herbarium specimens:	*Prunus americana* var. *nigra* (1)
Remarks:	More common than *T. pruni* Tul. as a cause of plum pocket in Ontario.

Taphrina confusa (Atk.) Giesenh.

Taxonomic position:	Ascomycetes, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	leaf blister
Hosts on record:	*Prunus virginiana*
Number of records:	1
Herbarium specimens:	*Prunus virginiana* (1)
Remarks:	This species is specific to *Prunus virginiana*. The single collection may be a reflection of the secondary level of importance placed on this host by FIDS staff in Ontario.

Taphrina communis

Taphrina confusa

Taphrina dearnessii Jenkins

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	leaf blister
Hosts on record:	*Acer rubrum*
Number of records:	1
Herbarium specimen:	*Acer rubrum* (1)
Remarks:	The presence of this fungus in adjacent states and in Quebec suggests it might be somewhat more frequent in Ontario than our single collection indicates.

Taphrina flava Farlow

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	yellow leaf blister
Hosts on record:	*Betula papyrifera*
Number of records:	1
Herbarium specimens:	*Betula papyrifera* (1)
Remarks:	This disease is characterized by small (5 mm) yellow to brown or reddish-brown leaf spots.

Taphrina dearnessii

Taphrina flava

Taphrina johansonii Sadebeck

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	catkin blister
Hosts on record:	*Populus tremuloides*
Number of records:	2
Herbarium specimens:	*Populus tremuloides* (2)
Remarks:	Cottonwood (*Populus* sp.) and *P. grandidentata* are also known as hosts for this species.

Taphrina letifera (Peck) Sacc.

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	leaf blister
Hosts on record:	*Acer spicatum*
Number of records:	1
Herbarium specimens:	*Acer spicatum* (1)
Remarks:	This fungus typically occurs on *Acer spicatum* and is very similar in many respects to *T. dearnessii*.

Taphrina johansonii

Taphrina letifera

Taphrina pruni Tul.

Taxonomic position:	Ascomycetes, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	plum pocket
Hosts on record:	*Prunus americana*, *P. nigra*
Number of records:	3
Herbarium specimens:	*Prunus americana* (1) *P. nigra* (2)
Remarks:	Although widespread in Europe, this species of *Taphrina* is encountered only infrequently in Ontario. It is suspected that this fungus is not native to North America.

Taphrina robinsoniana Giesenh.

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	catkin tongue
Hosts on record:	*Alnus incana*, *A. rugosa*, *Alnus* sp.
Number of records:	23
Herbarium specimens:	*Alnus incana* (4) *A. rugosa* (1) *Alnus* sp. (10)
Remarks:	This disease occurs on common *Alnus* spp.; the tongue-like structure protruding from the catkins is very striking.

Taphrina pruni

Taphrina robinsoniana

Taphrina wiesneri (Ráthay) Mix
syn.: *Taphrina cerasi* (Fuckel) Sadeb.

Taxonomic position:	Ascomycotina, Hemiascomycetes, Taphrinales, Taphrinaceae
Disease caused:	witches' broom
Hosts on record:	*Prunus pensylvanica*, *Prunus* sp.
Number of records:	4
Herbarium specimens:	*Prunus pensylvanica* (2) *Prunus* sp. (1)
Remarks:	This fungus is considered the most serious of the *Taphrina* species that attack *Prunus* spp.

Tubakia dryina (Sacc.) B. Sutton
syn.: *Actinopelte dryina* (Sacc.) Höhnel

Taxonomic position:	Deuteromycotina, Coelomycetes, Pycnothyriales, Actinopeltaceae
Disease caused:	leaf spot
Hosts on record:	*Quercus alba*, *Q. macrocarpa*, *Q. rubra*, *Quercus* sp., *Q. velutina*
Number of records:	20
Herbarium specimens:	*Quercus macrocarpa* (2) *Q. rubra* (4) *Quercus* sp. (1)
Remarks:	A rather common leaf spot in southern Ontario that has been associated with premature defoliation of *Quercus* spp. in years when infection is severe. Infection is usually quite localized.

Taphrina wiesneri

Tubakia dryina

Uncinula adunca (Wallr.: Fr.) Lév.
syn.: *Uncinula salicis* (DC.) Winter

Taxonomic position:	Ascomycotina, Plectomycetes, Erysiphales, Erysiphaceae
Disease caused:	powdery mildew
Hosts on record:	*Populus balsamifera*, *P. grandidentata*, *P. tremuloides*, *Populus* sp., *Salix* sp.
Number of records:	80
Herbarium specimens:	*Populus balsamifera* (9) *P. tremuloides* (4) *Salix* sp. (9)
Remarks:	A very common powdery mildew, collected almost every field season.

Valsa friesii (Duby) Fuckel
ana.: *Cytospora friesii* Sacc.
ana.: *Cytospora pinastri* Fr.

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	dieback
Hosts on record:	*Abies balsamea*
Number of records:	18
Herbarium specimens:	*Abies balsamea* (12)
Remarks:	This is a common cause of dead needles on *Abies balsamea*. The role of this fungus as a parasite is open to question, but it may hasten the death of needles already dying as a result of suppression or age.

Uncinula adunca

Valsa friesii

Valsa sordida Nitschke
ana.: *Cytospora chrysosperma* (Pers: Fr.) Fr.

Taxonomic position:	Ascomycotina, Pyrenomycetes, Sphaeriales, Diaporthaceae
Disease caused:	Cytospora canker
Hosts on record:	*Acer rubrum*, *A. saccharum*, *Populus alba*, *P. balsamifera*, *P. deltoides*, *P. eugenii*, *P. grandidentata*, *P. nigra* var. *italica*, *Populus* sp., *P.tremuloides*, *Salix* sp., *Sorbus* sp.
Number of records:	95
Herbarium specimens:	*Populus alba* (1) *P. balsamifera* (2) *P. eugenii* (2) *P. grandidentata* (1) *P. tremuloides* (4) *Populus* sp. (1) *Salix* sp. (3) *Sorbus* sp. (1)
Remarks:	The darkish disk and yellow or golden tendrils are characteristic of this fungus. This fungus infects trees that have wounds or that are weakened and is most often active in nurseries or amenity plantings.

Valsa sordida

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APPENDIX A

COMMON NAMES OF PATHOGENIC AGENTS

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Adelopus gaeumannii - Swiss needle cast

Asteromella fraxini - leaf spot ofash

Aureobasidium apocryptum - anthracnose of maple

Cladosporium subsessile - leaf spot of poplar

Climacodon septentrionalis - leaf spot of poplar

Coleosporium asterum - pine needle rust

Coleosporium viburni - needle rust of pine

Coniothyrium pini - needle blight of balsam fir

Cryptodiaporthe populea - poplar canker

Cylindrosporium fraxini - leaf spot of ash

Cytospora chrysosperma - Cytospora canker

Cytospora friesii - dieback of balsam fir

Cytospora kunzei - Cytospora canker of spruce

Cytospora nivea - Cytospora canker of poplar

Cytospora pinastri - dieback of pine

Diplocarpon mespili - pear leaf blight

Diplodia pinea - Diplodia tip blight of pine

Discosporium populeum - poplar canker

Discula betulina - anthracnose of birch

Discula campestris - anthracnose of maple

Discula platani - anthracnose of sycamore

Discula umbrinella - anthracnose of maple

Dothichiza populea - poplar canker

Dothistroma septospora var. *septospora* - red-band disease of pine

Drepanopeziza populi-alba - Marssonina leaf spot of white poplar

Drepanopeziza populorum - Marssonina leaf spot of poplar

Drepanopeziza salicis - leaf spot of willow

Drepanopeziza tremulae - leaf spot of poplar

Entomosporium maculatum - pear leaf blight

Entomosporium mespili - pear leaf blight

Erwinia amylovora - fire blight

Fabraea maculata - pear leaf blight

Fomes everhartii - trunk rot

Gloeosporium apocryptum - anthracnose of maple

Gloeosporium betulinum - anthracnose of birch

Gloeosporium brunneum - leaf spot of poplar

Gloeosporium nervisequum - anthracnose of sycamore

Gloeosporium platani - anthracnose of sycamore

Gloeosporium salicis - leaf spot of willow

Gnomonia leptostyla - leaf spot of walnut

Guignardia aesculi - leaf blotch of horse-chestnut

Hydnum septentrionale - heartwood rot

Kabatiella apocrypta - anthracnose of maple

Lecanosticta acicola - brown-spot needle blight

Leptodothiorella aesculicola - leaf blotch of horse-chestnut

Leucostoma kunzei - Cytospora canker of spruce

Leucostoma nivea - Cytospora canker of poplar

Linospora tetraspora - leaf blight of balsam poplar

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Meria laricis - larch needle cast

Monostichella coryli - leaf spot of beaked hazelnut

Monostichella salicis - leaf spot of willow

Mycosphaerella aucupariae - leaf spot of mountain-ash

Mycosphaerella dearnessii - brown-spot needle blight

Mycosphaerella effigurata - leaf spot of ash

Mycosphaerella pini - red-band disease of pine

Mycosphaerella populi - leaf spot of balsam poplar

Mycosphaerella populicola - leaf spot of poplar

Mycosphaerella populorum - leaf spot of poplar

Phacidium balsamea - snow blight

Phaeocryptopus gaeumannii - Swiss needle cast

Phaeoramularia maculicola - leaf spot of poplar

Phellinus everhartii - trunk rot of oak

Phyllosticta minima - leaf spot of maple

Phyllosticta paviae - leaf spot of horse-chestnut

Phyllosticta sorbi - leaf spot of mountain-ash

Phyllosticta sphaeropsoidea - leaf blotch of horse-chestnut

Piggotia coryli - leaf spot of beaked hazelnut

Pleuroceras populi - leaf spot of poplar

Puccinia sparganioides - ash leaf rust

Rhabdocline pseudotsugae ssp. *pseudotsugae* - needle cast

Rhizina inflata - root rot

Rhizina undulata - root rot

Rhizosphaera kalkoffii - needle blight

Rhizosphaera pini - needle blight

Sarcotrochila balsamea - snow blight

Scirrhia acicola - brown-spot needle blight

Scirrhia pini - red-band disease

Septoria musiva - leaf spot of poplar

Septoria populi - leaf spot of poplar

Septoria populicola - leaf spot of poplar

Sphaeropsis sapinea - Diplodia tip blight

Steccherinum septentrionale - heartwood rot

Stegonsporium acerinum - branch and twig canker

Stegonsporium pyriforme - branch and twig canker

Stegonsporium sp. - branch and twig canker

Taphrina americana - witches' broom of birch

Taphrina caerulescens - leaf blister of oak

Taphrina carnea - birch red-leaf blister

Taphrina cerasi - cherry witches' broom

Taphrina communis - plum pocket

Taphrina confusa - leaf blister of birch

Taphrina dearnessii - maple leaf blister

Taphrina flava - yellow leaf blister of birch

Taphrina johansonii - catkin blister of aspen

Taphrina letifera - maple leaf blister

Taphrina pruni - plum pocket

Taphrina robinsoniana - catkin tongue of alder

Taphrina wiesneri - cherry witches' broom

Tubakia dryina - leaf spot of oak and hickory

Uncinula adunca - powdery mildew

Uncinula salicis - powdery mildew

Valsa friesii - dieback of balsam fir

Valsa sordida - Cytospora canker of hardwoods

Venturia macularis - shoot blight

APPENDIX B

COMMON NAMES OF HOSTS

Abies balsamea - balsam fir

Acer
- *ginnala* - ginnala maple
- *nigrum* - black maple
- *platanoides* - Norway maple
- *pseudoplatanus* - sycamore maple
- *rubrum* - red maple
- *saccharinum* - silver maple
- *saccharum* - sugar maple
- sp. - maple species
- *spicatum* - mountain maple

Aesculus hippocastanum - horse-chestnut

Alnus
- *incana* - speckled alder, tag alder
- *rugosa* - speckled alder, tag alder
- sp. - alder species

Betula
- *alba* - white birch
- *alleghaniensis* - yellow birch
- *glandulosa* - resin birch
- *papyrifera* - white birch, paper birch
- sp. - birch species

Corylus cornuta - beaked hazel

Crataegus
- *monogyna* - maythorn or one-seeded hawthorn
- *oxycantha* - English hawthorn
- sp. - hawthorn species

Fagus sp. - beech species

Fraxinus
- *nigra* - black ash
- *pennsylvanica* - red ash
- sp. - ash species

Juglans
- *cinerea* - butternut
- *nigra* - black walnut
- sp. - walnut sp.

Larix
- *decidua* - European larch
- *laricina* - eastern larch, tamarack
- sp. - larch species

Malus sp. - apple species

Picea
- *abies* - Norway spruce
- *glauca* - white spruce
- *mariana* - black spruce
- *pungens* - Colorado blue spruce
- *rubens* - red spruce
- sp. - spruce species

Pinus
- *banksiana* - jack pine
- *contorta* - lodgepole pine
- *monticola* - western white pine
- *mugo* var. *mughus* - mugho pine
- *nigra* - Austrian pine
- *ponderosa* - ponderosa pine
- *resinosa* - red pine
- *strobus* - white pine
- *sylvestris* - Scots pine

Platanus sp. - sycamore species

Populus
- *alba* - white poplar
- *balsamifera* - balsam poplar
- *X berolinensis* - hybrid poplar
- *X canadensis* - Carolina poplar
- *deltoides* - eastern cottonwood
- *deltoides* var. *occidentalis* - plains cottonwood
- *X eugenei* - Carolina poplar
- *grandidentata* - largetooth aspen
- hybrid - hybrid poplar
- *laurifolia* - Siberian poplar
- *nigra* - black poplar
- *nigra* var. *italica* - Lombardy poplar
- *X petrowskyana* - hybrid poplar
- *X rasumowskyana* - hybrid poplar
- sp. - poplar species
- *tremuloides* - quaking aspen
- *trichocarpa* - black cottonwood

Prunus
- *americana* - wild plum
- *americana* var. *nigra* - plum
- *nigra* - Canadian plum
- *pensylvanica* - pin cherry
- sp. - plum, cherry species
- *virginiana* - choke cherry

Pseudotsuga
- *menziesii* - Douglas-fir
- sp. - Douglas-fir

Pyrus sp. - pear species

Quercus
- *alba* - white oak
- *macrocarpa* - bur oak
- *prinus* - chestnut oak
- *rubra* - red oak
- sp. - oak species
- *velutina* - black oak

Salix sp. - willow species

Sorbus
- *americana* - American mountain-ash
- *aria utescens* - white-beam mountain-ash
- *aucuparia* - European mountain-ash
- *decora* - showy mountain-ash
- sp. - mountain-ash species

Spartina
- *pectinata* - cordgrass
- sp. - cordgrass

Viburnum cassinoides - wild raisin, witherod